

**United States Patent** [19]**Benton**[11] **Patent Number:** **4,523,087**[45] **Date of Patent:** **Jun. 11, 1985**[54] **TRANSACTION VERIFICATION SYSTEM  
USING OPTICAL COUPLING DATA  
COMMUNICATION LINK**[76] **Inventor:** **William M. Benton, 2888 NE. 25th  
Ct., Fort Lauderdale, Fla. 33305**[21] **Appl. No.:** **451,169**[22] **PCT Filed:** **Apr. 7, 1981**[86] **PCT No.:** **PCT/US81/00450**§ 371 Date: **Dec. 7, 1982**§ 102(e) Date: **Dec. 7, 1982**[87] **PCT Pub. No.:** **WO82/03484****PCT Pub. Date:** **Oct. 14, 1982**[51] **Int. Cl.<sup>3</sup> .....** **G06F 15/30**[52] **U.S. Cl. ....** **235/379; 235/380;  
235/432; 340/825.33**[58] **Field of Search ....** **235/379, 432, 380;  
364/406, 408, 519, 189; 340/825.33**[56] **References Cited****U.S. PATENT DOCUMENTS**

3,648,021	3/1972	Rogers .....	340/825.33 X
4,001,550	1/1977	Schatz .....	235/379
4,007,355	2/1977	Moreno .....	235/379
4,053,735	10/1977	Foudos .....	340/825.33 X
4,277,837	7/1981	Stuckert .....	364/900

*Primary Examiner*—David L. Trafton*Attorney, Agent, or Firm*—Lowe King Price & Becker[57] **ABSTRACT**

A system for providing authorization to complete a requested transaction comprises a portable verification device (20) carried by each user to be inserted into a receptacle (34) at a point of transaction for authorization verification. The portable device (20) comprises a housing (22) containing data processing and storage circuitry, a keyboard (24) for manually entering identification and transaction data, and a display. An optical transceiver (70) exposed through the housing (22) establishes a bidirectional optical data link between the portable device (20) and a corresponding optical transceiver (80) in the receptacle (34). The optical data link is preferably in the non-visible wave length range, e.g. infrared, to make the system immune to ambient visible light and to mask optical data from the user. The portable device can be used either in an off-line mode, wherein transaction data, such as account balance and user restrictions, are stored in memory within the device and transactions are approved based upon keyboard entered data and data stored in device (20), or in an on-mode, wherein transactions are authorized based upon keyboard entry of the personal identification number and data coupled between the portable device and a host computer via the optical channel. Vouchers (30) are imprinted by a thermal print head (56) within device (20) following authorization.

**10 Claims, 11 Drawing Figures**